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Abstract

Despite the abundant anecdotal evidence on the benefits of information technology (IT) outsourcing, whether the stock market reacts favorably to such a governance choice remains a puzzle. In line with the recent emphasis on a value-based approach to evaluating firms, we adopt an event-study method to examine the market-impacting effects of IT outsourcing. Our analysis, based on a sample of 58 IT outsourcing announcements obtained from a systematic search of online databases, indicates that this governance decision contributes positively and significantly to stock returns. The finding is robust across both service and industrial sectors. Further, we demonstrate that the stock market reacts favorably to IT outsourcing decisions by firms with a high business cost structure and low business performance. We discuss the results pertaining to stock market reaction in the context of corporate performance assessment and offer avenues for research extensions.

Keywords: Information technology outsourcing; information technology governance; information technology strategy; event study methodology.

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INTRODUCTION

Within academic and practitioner circles, there is a growing interest in the role of information technology (IT) outsourcing as a structural mechanism to acquire IT-related competences and to attain competitive advantage. The academic research has focused on economic modeling of software development outsourcing contracts (Richmond, Seidman, and Whinston, 1992; Whang, 1992), empirical examinations of the key firm-level determinants of IT outsourcing (Loh and Venkatraman, 1992a) as well as alternative influence sources in the diffusion of IT outsourcing (Loh and Venkatraman, 1992b). The practitioner community, on the other hand, has offered numerous frameworks that guide IT outsourcing decisions by extolling the benefits of this mode of IT governance.[1] The conventional wisdom appears to be that IT outsourcing is an attractive option for user organizations since it allows them to streamline their internal cost structure while obtaining critical technological capabilities more effectively than otherwise possible (Aucoin, 1991).

Despite the prevalence of IT outsourcing, evidence on the beneficial impact of this outsourcing is only implicit in descriptions of isolated cases that rely on individual company assessments.[2] For instance, a leading IT trade periodical reported: "Recent interviews with IS executives at some of the leading companies that have outsourced their data processing, such as H.J. Heinz Co., National Car Rental System, Inc. and Hibernia Bancorp, revealed a high degree of satisfaction so far."[3] This paper addresses the gap between academia and practice by systematically focusing on the specific research questions: does the stock market react favorably to IT outsourcing decisions, and more specifically, how does a set of firm-level characteristics affect this market reaction?

For this purpose, we identified a set of IT outsourcing contracts using a comprehensive bibliometric search. Subsequently, we employed a standard event-

study methodology to analyze the stock market reaction by examining the abnormal returns of the underlying common stock associated with the IT outsourcing announcements. These abnormal returns represent the changes in the stock prices of a firm relative to changes in a market index. In other words, they signify what an investment in a stock is able to earn over and above that of the entire market. Along this reasoning, the stock market reaction to IT outsourcing is deemed to be favorable if the abnormal returns are significantly positive. This analytical methodology has been successfully employed in a variety of research contexts for assessing the impact of corporate decisions such as: mergers and acquisitions (Jensen and Ruback, 1983; Singh and Montgomery, 1987), joint ventures (Koh and Venkatraman, 1991; McConnell and Nantell, 1985), and strategic investments (Woolridge and Snow, 1990). In addition, we examine how the stock market reaction to IT outsourcing decisions is being affected by three important firm-level characteristics, namely: business cost structure, business profitability, and financial leverage.

THEORETICAL PERSPECTIVES

We build our conceptual arguments as follows. First, we subscribe to an organizational economic paradigm that firms make efficient governance choices, and develop specific arguments that the stock market reacts favorably to IT outsourcing as a class of governance decisions. Subsequently, we delineate a set of firm-level characteristics to specify how these attributes affect the stock market reaction to IT outsourcing decisions.

Stock Market Reaction to IT Outsourcing Decisions

The sourcing of IT resources, as in other factor inputs, can be viewed within a broader category of "make-versus-buy" decisions. The stylized view is that a firm evaluates the total costs of producing an input inside (i.e., insourcing)

relative to those of procuring it from an external supplier (i.e., outsourcing). Within this perspective, the firm selects the most efficient mode of governance to organize its productive activities (Williamson, 1975, 1985). This choice entails the minimization of both transaction and production costs that pervade the levels of the firm (user) as well as the dyad (user-vendor). The minimization of these costs is synonymous to the maximization of profits which would then be viewed favorably by the stock market.

In line with this governance perspective, IT outsourcing can be considered within the context of a broader range of interorganizational cooperative arrangements. These arrangements have been adopted by firms to "gain fast access to new technologies or new markets, to benefit from economies of scale in joint research and/or production, to tap into sources of know-how located outside the boundaries of the firm, and to share the risks for activities that are beyond the scope of the capabilities of a single organization" (Powell, 1990: 315). Such advantages of cooperative activities have been argued to impact the market value of firms, with consistent empirical results that point to favorable stock market reaction especially in the arena of joint ventures (Koh and Venkatraman, 1991; McConnell and Nantell, 1985; Woolridge and Snow, 1990).

In the specific context of IT outsourcing, efficiency-based reasonings have formed a substantial part of the motivation underlying the IT governance choice. For example, the impetuses for IT outsourcing cover:[4] (1) strategic considerations that include the need to focus on core competence as well as to attain flexibility (Hovey, 1990); (2) economic considerations that include the need to allocate resources efficiently such as through "rightsizing" (Hoplin and Hsieh, 1992) and to capture accounting-based incentives (Cylix Communications Corp., 1992); (3) organizational considerations that include the need to build knowledge (Quinn, 1992) or to redesign business processes (Guimaraes and Wells, 1992); and (4)

technical considerations that include the need to acquire new technologies and share technology-based risks (Clermont, 1991). On the other hand, IT outsourcing, like other relationship-based arrangements, has its set of risks. This comprises, for instance, misrepresentation of benefits, contractual breach, dependence on specific vendors, irreversibility of decision, leakage of confidential information, and loss of autonomy or control (Due, 1992; Suh, 1992).[5]

We build our stock market-impacting argument of IT outsourcing along the economic paradigm that managers maximize profits when selecting amongst strategic initiatives. This view is augmented by the powerful monitoring capabilities of the capital market (Jensen and Meckling, 1976), the managerial labor market (Jensen and Zimmerman, 1985), and the market for corporate control (Jensen and Ruback, 1983). The control of managerial behavior emanating from these market imperatives have been positioned as overbearing drivers in ensuring firm value maximization (Rappaport, 1986; Reimann, 1987). The basic rationale is that the future income-generating power of a firm is increased when investment decisions are made rationally to optimize returns. Accordingly, the litmus test for acceptable managerial actions is the ultimate effects of the chosen decisions on shareholder wealth. In this respect, we contend that firms that outsourced their IT have, in general, performed substantial benefit-cost analyses, and expected that this change in IT governance would be perceived favorably by the stock market.

Recent scholarly works in IT outsourcing are in line with this economic view. Theoretically, Richmond et al. (1992) build an incomplete contracting model for IS development outsourcing that is based on corporate decision makers adopting rational investment choices. Further, Whang (1992) uses a game-theoretic model to show that outsourcing can be an optimal outcome aligning incentives of the contracting parties under asymmetric information.

Synthesizing the above discussion, we propose:

Hypothesis 1: On average, the stock market reacts favorably to IT outsourcing decisions.

Cross-Sectional Determinants of Stock Market Reaction

A general finding that the stock market, on average, reacts favorably to IT outsourcing decisions is only partially useful for research and practice. A necessary and more important follow-up question to the descriptive result would be whether this market reaction differs across firm attributes such that we can develop prescriptive implications. Guided by this reasoning, we identify a set of firm-level characteristics to assess whether the stock market reaction is affected by them. Following Loh and Venkatraman (1992a), we focus on business cost structure, business performance, and financial leverage.

Business Cost Structure. The business cost structure is a fundamental component within the competitive strategy of a firm (Porter, 1980). Within the setting of a competitive marketplace, the relative costs of producing and selling the goods critically affect a firm's success. When the cost structure is unfavorable, the firm faces the need to restructure its business so as to maintain or regain its fundamental sources of competitive advantage. This includes a reconfiguration of its organizational infrastructure including the mode of governing the IT activities (Elam, 1988). Further, Keen (1991) and Strassmann (1990) assert that IT is an important business resource with strong implications for its overall cost structure. Indeed, a dominant view within the professional community is that: "much of what is fanning the fire for ... outsourcing is that business is having to restructure to remain competitive."[6]

On a more specific note, we argue that the total costs associated with a particular mode of IT governance are manifested not only in the direct costs of

technology as a resource input but also in the indirect costs of supporting the enterprise. This is because the use of IT functionalities pervades the value chain of a business (Porter and Millar, 1985) as well as its relationships with upstream suppliers and downstream distributors (Cash and Konsynski, 1985). Thus, we argue that the costs of IT governance has direct impact on business cost structure. When a firm has a high business cost structure, it then faces a greater imperative to evaluate the underlying conduct of its business operations including its mode of IT governance. Under such a context, the adoption of IT outsourcing constitutes a conscious effort of the firm to enhance its ability to compete in the marketplace and create value for its shareholders. Hence, we contend:

Hypothesis 2: The stock market reacts favorably to IT outsourcing decisions when a firm's business cost structure is high.

Business Performance. Superior business performance provides a foundation for the ability of a firm to create organizational slack (Cyert and March, 1963). These slack resources enable a firm to effectively buffer internal pressures and external shocks. When a firm is not performing well vis-a-vis its competition, it has a higher necessity to mitigate its exposure to environmental fluctuations (Sharfman, Wolf, Chase, and Tansik, 1988). It is commonly accepted that IT is one of the key corporate resources that is subject to high levels of uncertainty (see for instance, Weizer and Associates, 1991). Responding to such uncertainties under an inhouse mode of IT governance, in general, requires correspondingly higher levels of slack resources than alternative modes of outsourcing. This is because IT outsourcing mitigates the requirements for firms to be continually on the leading edge of the technology frontier and to position sophisticated technological capabilities within the core of the organization (Quinn, 1992).

On a more specific perspective, a widely-read trade periodical reported, "Reduced profits ... are causing management to look everywhere to increase margins."[7] This effort by a firm to acquire slack is thus a key driver in setting its strategic thrust within the competitive marketplace. In this respect, firms may find it sensible to divest or redeploy technological assets in order to streamline its mode of operation (Harrigan, 1980). Such efforts may involve elements of the firm's IT infrastructure, thus entailing a fundamental change in the governance of IT. In other words, the choice of an appropriate sourcing strategy is guided by the imperative to improve its viability or to enhance its future market value. We therefore argue:

Hypothesis 3: The stock market reacts favorably to IT outsourcing decisions when a firm's business performance is low.

Financial Leverage. Like other corporate resources, financial resources are scarce. The need to efficiently allocate these resources is an influential impetus to deriving competitive advantage. The acquisition of infrastructural assets including IT is often financed through external fund providers. One major factor leading to IT outsourcing has been the pressure on the firm to reduce its dependence on debt financing for its IT infrastructure. As widely cited amongst practitioners, increased debt "has been a major reason for cutting costs in the IS area, thus supporting the use of outsourcing...."[8] Financial leverage can result in problems relating to bankruptcy as well as agency (Jensen and Meckling, 1976; cf. Modigliani and Millar, 1963). Further, the cost of equity capital, in general, increases with financial leverage (Hsia, 1981).

More specifically, the choice between debt and equity depends on the characteristics of the assets in which the funds are used (Williamson, 1988). Redeployable assets are more efficiently financed through debt, while non-redeployable assets are more appropriately funded by equity. The degree of

redeployability of an installed IT infrastructure is hampered by the complex and customized nature of systems, applications, and staff (Markus, 1984). Overall, a high level of debt can then be efficiently mitigated through IT outsourcing. Thus, stock investors would place a premium on firms that outsourced when it is highly leveraged. Hence, we posit:

Hypothesis 4: The stock market reacts favorably to IT outsourcing decisions when a firm's financial leverage is high.

METHODS

Data

We needed to select a set of companies that had announced their intentions to outsource a part or the whole of the corporate IT infrastructure. We performed a comprehensive search of newspapers, newswires, and periodicals in Lexis-Nexis, an online database product of Mead Data Central, Inc. Because of the variety of information sources, we wanted to have a consistent method to identify the announcements. For this purpose, we delineated the outsourcing contracts based on an inductive content-analytic framework (Krippendorff, 1980; Weber, 1990). We initially retrieved the textual documents of a sample of well-known outsourcing contracts. We then employed the whole text as our recording units and classified the important key words/phrases pertaining to several categories within the broad theme of IT outsourcing. After an exploratory investigation, we inferred a content-analytic structure (see Appendix A) which was applied to ensure that all textual outputs from Lexis-Nexis are indeed valid announcements of IT outsourcing.

Since we are interested in examining the stock market reaction to IT outsourcing decisions, we required that each outsourcing announcement pertained to a publicly traded company listed on a major stock exchange (e.g.,

NYSE, AMEX, or NASDAQ). The time series of stock and market data were assembled from computer tapes supplied by the Center for Research in Security Prices (CRSP) at the University of Chicago. Our sample selection is hence limited by the availability of these complete series for our entire estimation time frame. A final sample of 58 outsourcing announcements was obtained and used for testing Hypothesis 1. This portfolio comprised 30 stocks pertaining to firms in the service sector and 28 stocks pertaining to firms in the industrial sector.

We also needed publicly-disclosed financial data for each of the firms engaged in outsourcing. These were assembled from Standard and Poor's Compustat II and Lotus' CD/Corporate. The requirement for complete data across these sources restricted our sample size to 52 which was used for testing Hypotheses 2 to 4.

Analytical Framework

To test Hypothesis 1, we applied the event study methodology that has been used in various forms by financial researchers (see Brown and Warner, 1980, 1985). The initial task is to select the appropriate analytical time frames: (1) estimation period; and (2) event windows. The purpose of the estimation period is to obtain the parameters that are required for the calculation of abnormal returns associated with each announcement for an event day or for an entire event window. We denote the day in which an outsourcing arrangement is announced in the news media as t=0. Our estimation period is a 201-trading day interval [-270, -70]. Further, we specified four possible event windows [-1,0], [-1,1], [-1,2], and [-1,3] to capture the possibilities of pre-announcement information leakages and post-announcement information delays.

The fundamental element of analysis is the stock return which is stationary over time and can be more effectively used for computational purposes (cf. the stock price which is nonstationary). The stock return $R_{i,t}$ is defined as:

$$R_{i,t} = (P_{i,t} - P_{i,t-1} + \Delta_{i,t})/P_{i,t-1}$$

where $P_{i,t}$ refers to price, $\Delta_{i,t}$ denotes any direct modification to shareholder wealth (e.g., dividends or recapitalization), and subscripts i and t indicate a stock and a trading day, respectively. The stock return can be econometrically estimated via several methods. In this study, we applied the widely-used and theory-motivated market model (Fama, Fisher, Jensen, and Roll, 1969) that is rooted in the traditional Sharpe-Lintner-Mossin capital asset pricing model (CAPM). Accordingly, the predicted stock return $\hat{R}_{i,t}$ can be specified as follows:

$$\hat{R}_{i,t} = \hat{\alpha}_i + \hat{\beta}_i R_{m,t}$$

where $R_{m,t}$ is the return on the market index while $\hat{\alpha}_i$ and $\hat{\beta}_i$ are the estimated ordinary least-square (OLS) regression coefficients for the stock. In our study, we took the Standard & Poor 500 as a proxy for the market index.

The abnormal return (or residual) $AR_{i,t}$ for a stock, which is normally distributed, in a particular trading day t is:

$$AR_{i,t} = R_{i,t} - \hat{R}_{i,t}$$

The average abnormal return for a portfolio of stocks is simply the arithmetic mean of these individual abnormal returns. If we assume cross-sectional independence of the abnormal returns between all stocks, we can obtain the standardized abnormal returns $SR_{i,t}$ as follows:

$$SR_{i,t} = AR_{i,t}/\sigma(AR_i)$$

where $\sigma(AR_i)$ represents the standard deviation of the stock's abnormal returns that is computed using:

$$\sigma(AR_i) = \left[\sum_{t=t_1}^{t_2} (AR_{i,t} - \overline{AR_i})^2 / (t_2 - t_1) \right]^{1/2}$$

$$\overline{AR_i} = \left[1/(t_2-t_1+1)\right] \sum_{t=t_1}^{t_2} AR_{i,t}$$

The statistic for testing the null hypothesis that the abnormal return for any trading day t equals zero for a portfolio (sample) of firms is as follows:

$$Z_{[t]} = \sum_{i=1}^{N} SR_{i,t} \Big/ N^{1/2}$$

where N is the number of stocks in the sample. This is normally distributed with zero mean and unit variance for a large sample.

For a multiple day trading window $[w_1, w_2]$, the cumulative abnormal returns $CAR_i(w_1, w_2)$ is defined as:

$$CAR_i(w_1,w_2) = \sum_{t=w_1}^{w_2} AR_{i,t}$$

The average cumulative abnormal return for a portfolio of stocks is simply the arithmetic mean of these individual cumulative abnormal returns. Using the standardized abnormal returns, the statistic for testing the null hypothesis that the cumulative abnormal returns for an event window $[w_1, w_2]$ equals zero is easily derived as:

$$Z_{[w_1,w_2]} = \sum_{t=w_1}^{w_2} \sum_{i=1}^{N} SR_{i,t} \Big/ [N(w_2-w_1+1)]^{1/2}$$

This is distributed normally with zero mean and unit variance for a large sample.

Cross-Sectional Regressions

To test Hypotheses 2 to 4, we utilized a multiple regression methodology based on a cross-section of the events in the portfolio. We measured the dependent variable, stock market reaction, using the cumulative standardized abnormal returns as computed earlier. To demonstrate the robustness of the results, we performed separate regressions using these returns associated with all the four

event windows as specified before. The variables are denoted $Y_{[-1,0]}$, $Y_{[-1,1]}$, $Y_{[-1,2]}$, and $Y_{[-1,3]}$ respectively.

For the independent variables, we applied the following operationalizations: (1) business cost structure (X_1) was represented by the sum of cost of goods sold and selling, general, and administrative expenses normalized by total assets; (2) business profitability (X_2) was taken as the return on investments (i.e., net income divided by total assets); and (3) financial leverage (X_3) was reflected by the debt-equity ratio (i.e., long-term debt divided by shareholder equity). We controlled for firm size by a variable, X_4, which is total assets measured in billion dollars. In addition, a binary dummy variable, X_5, that controlled for industry sector was used; this equals one if the firm is in the industrial sector and zero if it is in the service sector. The variables X_1 to X_5 were computed based on financial data obtained for each company in the fiscal year immediately preceding the outsourcing contract announcement. To examine the impact of outsourcing categories, we used five similar binary dummy variables (X_6, X_7, X_8, X_9, and X_{10}) that equal one if the contract falls under the respective types: application development, data center/ processing, PC services, system integration, and telecommunications/ network, and equal zero otherwise.

We performed eight sets of regression using four different dependent variables under two broad econometric specifications (I and II) as follows:

Specification (I)

$$Y = b_0 + b_1 X_1 + b_2 X_2 + b_3 X_3 + b_4 X_4 + b_5 X_5 + e$$

Specification (II)

$$Y = b_0 + b_1 X_1 + b_2 X_2 + b_3 X_3 + b_4 X_4 + b_5 X_5 + b_6 X_6 + b_7 X_7 + b_8 X_8 + b_9 X_9 + b_{10} X_{10} + e$$

where e represents the random error in a conventional OLS regression model. The first specification incorporates main and control independent variables based on firm-level determinants of IT outsourcing. The second specification, which

includes a set of control variables on the type of outsourcing, aims to further examine whether the various outsourcing categories impose a differential impact on the stock market reaction.

RESULTS

Hypothesis 1: Stock Market Reaction to IT Outsourcing Decisions

We estimated the market model for each of the stocks in our portfolio using the trading interval [-270,-70]. In Table 1, we depict the abnormal returns associated with each single trading day in the interval [-3,4]. These returns range from -1.45% to 0.97% for the 8 trading days surrounding the event day. We note that the standardized abnormal returns are statistically significant greater than zero just before and after the event day. This in is line with our earlier expectations of information leakages and delays. For the entire sample, the trend of information delay is especially evident at t=2 where the standardized abnormal return is significant at $p<0.01$.

Within the event study methodology, the extent of stock market reaction is more appropriately analyzed using the cumulative abnormal returns for the selected event windows. Table 2 shows that these cumulative returns range from 0.08% to 1.78%. It also displays the inferential results of the cumulative standardized abnormal returns for our event windows. We observe that such returns are statistically greater than zero for the windows [-1,1] ($p<0.05$), [-1,2] ($p<0.01$), and [-1,3] ($p<0.01$). The findings also suggest that a slight information delay is prevalent in our samples. In Figure 1, we plot the average cumulative abnormal returns for a trading interval [-30,+60]. Here, we can graphically verify that the abnormal returns rise just after the event of IT outsourcing and appear to be permanent.

TABLE 1
Abnormal Returns for Single Trading Days

Trading Day	Average Abnormal Returns	Standardized Abnormal Returns	
		Mean	Test Statistic
t=-3	-0.5718%	-0.0287	-0.218
t=-2	-1.4532%	0.1190	0.906
t=-1	0.0498%	0.1735	1.321+
t=0	0.0265%	0.0190	0.145
t=1	0.9702%	0.2154	1.640+
t=2	0.7310%	0.3177	2.420**
t=3	-0.7340%	0.0350	0.266
t=4	-0.0247%	-0.0527	-0.401

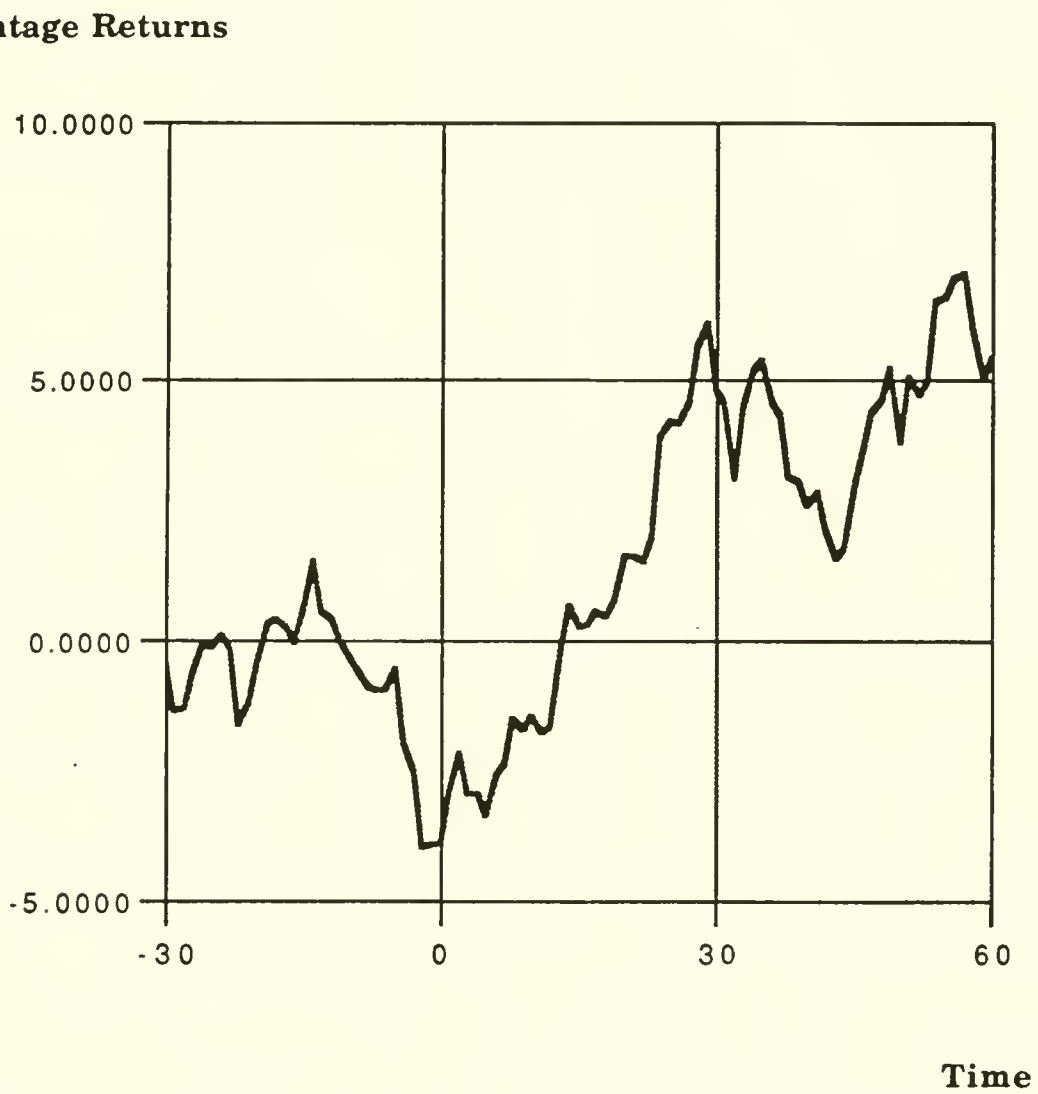
Note: + $p<.10$; ** $p<.01$

TABLE 2
Cumulative Abnormal Returns for Multiple-Day Event Windows

Event Window	Average Cumulative Abnormal Returns	Cumulative Standardized Abnormal Returns	
		Mean	Test Statistic
[-1,0]	0.0763%	0.1925	1.037
[-1,1]	1.0465%	0.4079	1.794*
[-1,2]	1.7775%	0.7256	2.763**
[-1,3]	1.0435%	0.7606	2.591**

Note: * $p<.05$; ** $p<.01$

FIGURE 1
A Time Plot of Average Cumulative Abnormal Returns



In Appendix B, we provide details of testing Hypothesis 1 in subsamples pertaining to both service and industrial sectors. We note that there are no significant differences in the abnormal returns for every trading days surrounding the event. In addition, there are no significant differences in the cumulative abnormal returns across both sectors for all the event windows. The robustness of our results across industry sectors is thus established.

In sum, our overall results confirm that the stock market reacts favorably to IT outsourcing decisions. Support is thus established for Hypothesis 1.

Hypotheses 2 to 4: Cross-Sectional Determinants of Stock Market Reaction

In Tables 3 and 4, we show the results for the four regressions in each of the specifications (I) and (II). In all these estimations, the regression coefficients are both statistically significant and in the expected directions for two of the main variables, business cost structure and business performance. The impact of the main variable, financial leverage, is not statistically significant although the direction of change is in line with our expectations. As for the control variables, the coefficient for industry sector is not statistically significant, but that for firm size is negatively significant. Further, the effects of IT outsourcing categories are generally insignificant except for three isolated marginal cases. Appendix C presents the means, standard deviations, and correlation coefficients of all the variables used in the cross-sectional regression.

In summary, our results provide support that the stock market reacts favorably to IT outsourcing when a firm's business cost structure is high (Hypothesis 2) and when its business performance is low (Hypothesis 3). However, the evidence is inconclusive that this reaction is favorable when the financial leverage is high (Hypothesis 4).

TABLE 3
Regression Results for Cross-Sectional Analysis (I)

	Stock Market Reaction							
	$Y_{[-1,0]}$		$Y_{[-1,1]}$		$Y_{[-1,2]}$		$Y_{[-1,3]}$	
	Mean	t-Statistic	Mean	t-Statistic	Mean	t-Statistic	Mean	t-Statistic
Main Variables								
Business Cost Structure (X_1)	0.8171	2.094*	1.3902	2.730**	1.0915	1.656$^+$	1.5122	1.917*
Business Performance (X_2)	-7.9721	-4.075**	-6.9784	-2.733**	-7.9058	-2.392**	-7.3980	-1.871*
Financial Leverage (X_3)	0.0039	0.033	0.0357	0.237	0.0354	0.182	0.0153	0.065
Control Variables								
Firm Size (X_4)	-0.0207	-2.649**	-0.0149	-1.464$^+$	-0.0196	-1.485$^+$	-0.0220	-1.397$^+$
Industry Sector (X_5)	-0.4169	-0.897	-0.5662	-0.933	-0.2791	-0.355	-0.8842	-0.941
Constant	0.2536	0.636	0.0375	0.072	0.5164	0.766	0.6316	0.783
Model Fit								
F	8.040**		5.115**		3.076*		2.811*	
R^2	0.466		0.357		0.251		0.234	

Note: $^+$ p<.10; * p<.05; ** p<.01

TABLE 4
Regression Results for Cross-Sectional Analysis (II)

	Stock Market Reaction							
	$Y_{[-1,0]}$		$Y_{[-1,1]}$		$Y_{[-1,2]}$		$Y_{[-1,3]}$	
	Mean	t-Statistic	Mean	t-Statistic	Mean	t-Statistic	Mean	t-Statistic
Main Variables								
Business Cost Structure (X_1)	0.8488	2.050*	1.4594	2.765**	1.2244	1.750*	1.7475	2.076*
Business Performance (X_2)	-8.0844	-3.819**	-6.4507	-2.391**	-7.0496	-1.971*	-7.1008	-1.650+
Financial Leverage (X_3)	0.0079	0.063	0.0808	0.508	0.1107	0.525	0.1091	0.430
Control Variables								
Firm Size (X_4)	-0.0210	-2.590**	-0.0158	-1.532+	-0.0221	-1.609+	-0.0252	-1.525+
Industry Sector (X_5)	-0.5182	-1.033	-0.6542	-1.023	-0.0193	-0.023	-0.7293	-0.715
Application Development (X_6)	-0.1503	-0.231	0.4242	0.511	0.6765	0.615	0.3208	0.242
Data Center/Processing (X_7)	0.4710	0.736	1.3716	1.681+	0.1333	0.123	-0.1357	-0.104
PC Services (X_8)	1.2786	1.063	1.3505	0.881	-0.1499	-0.074	0.3308	0.135
System Integration (X_9)	-0.2575	-0.252	-0.5609	-0.431	-2.4979	-1.447+	-2.2276	-1.072
Telecommunications/Network (X_{10})	0.3085	0.554	1.1120	1.568+	0.4241	0.451	0.7916	0.700
Constant	-0.1501	-0.188	-1.4616	-1.438+	0.0117	0.009	0.6316	0.783
Model Fit								
F	4.036**		2.981**		1.691		1.501	
R^2	0.496		0.421		0.292		0.268	

Note: + p<.10; * p<.05; ** p<.01

DISCUSSION

We began the study with a general research question, namely: does the stock market react favorably to IT outsourcing decisions? Our expectation of a positive reaction was based on a general assertion that firms which outsource their IT infrastructure do so with a view to streamline their cost of IT operations and/or to develop new sources of IT competences. These are actions that are expected to impact positively on abnormal returns since the stock market monitors and responds systematically to the various strategic actions by corporations. We positioned this research effort in line with prior studies that have demonstrated the link between strategic actions and stock market reaction (see Lubatkin and Shrieves, 1986 for a review).

Our results are particularly noteworthy in the sense that it is the first empirical assessment of a positive linkage between IT outsourcing and stock market reaction. Further, we were able to demonstrate that investors attribute a return premium for a firm that outsources its IT infrastructure when its business cost structure is high and its business performance is low. These results are strongly encouraging since they corroborate the conventional wisdom that IT outsourcing could be favorably viewed by the investor community and that firms with specific characteristics are able to generate a greater level of favorable reaction. Overall, our analysis and results can be positioned as a rigorous and objective attempt to narrow the disparity between researchers and practitioners in the examination of consequences of IT outsourcing.

This set of results complements the findings that sought to relate IT outsourcing expenditures to some firm-level factors in our previous study (Loh and Venkatraman, 1992a). Specifically, we have demonstrated that business cost structure has a significant impact on the level of IT outsourcing in our previous study. In the present study, we have augmented this specific result by establishing

a relationship between IT outsourcing decisions and stock market reaction. While business performance did not emerge as a significant determinant of IT outsourcing levels in our previous study, this study indicates that it plays a key role in affecting the extent in which the stock market reaction is favorable. Finally, in both studies, financial leverage is not a critical influence, possibly implying that IT outsourcing has more direct linkages with operational characteristics (business cost and business performance) rather than on financial characteristics as defined by the debt-equity structure.

In addition, our results indicate that one of our control variables -- firm size -- is a significant discriminator of stock market reaction to IT outsourcing decisions. We believe this is due to an argument that, *ceteris paribus*, larger firms have bigger and more diverse IT infrastructure (Weill and Olson, 1989).[9] Smaller firms are thus unable to reap the economies of scale and scope inherent in a big and diverse IT infrastructure (Bergstrom, 1990). On the other hand, IT outsourcing allows such firms to share the gains with an appropriate vendor that can pool the IS requirements of multiple clients. It is thus reasonable to posit that the stock market reaction to IT outsourcing decisions is more favorable for smaller firms.

Relating Stock Market Reaction to Corporate Performance

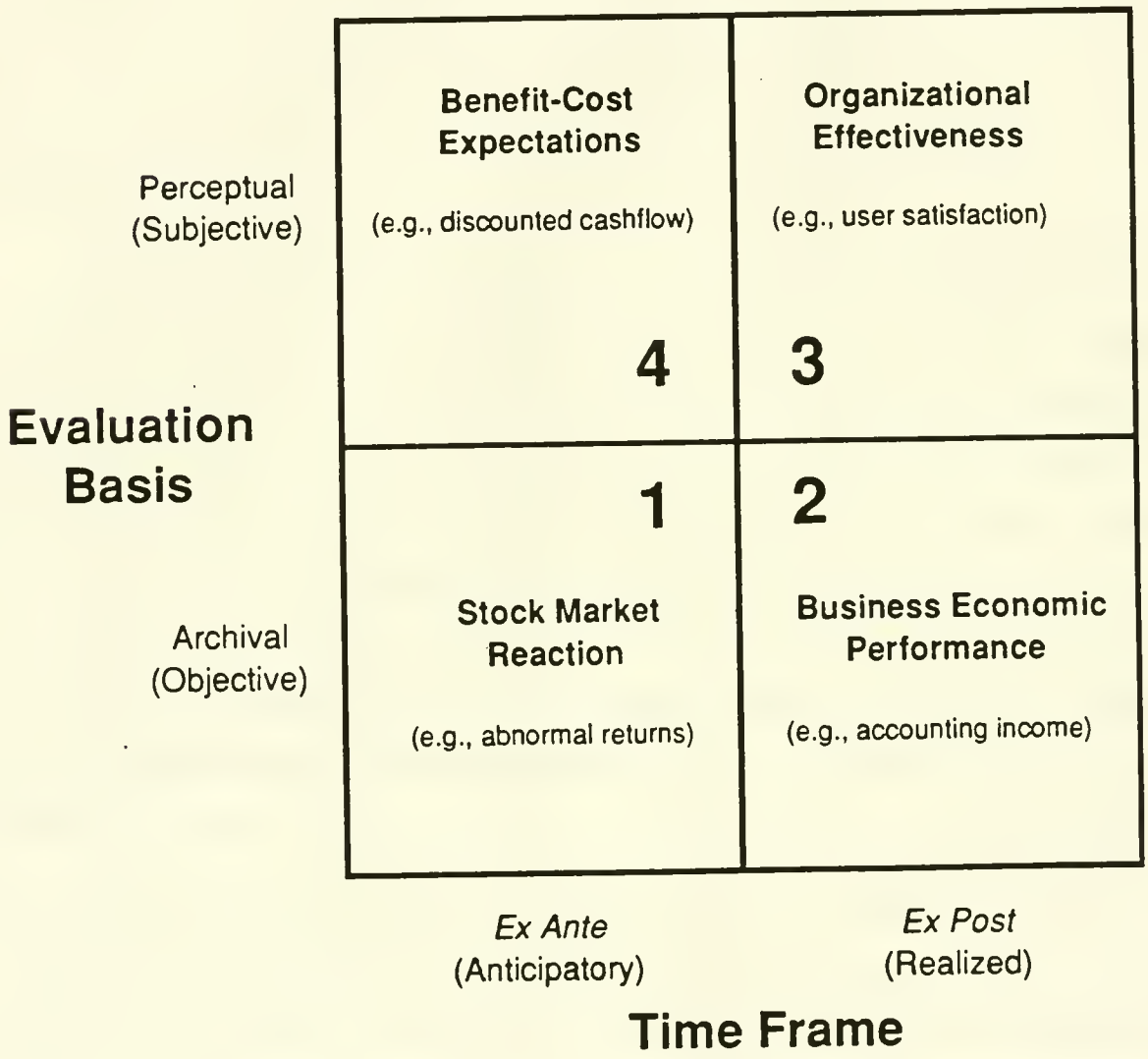
Our study has focused on the stock market reaction to a category of corporate decisions, namely: IT outsourcing. The rationale of this event-based approach is that the market prices of a firm's common stock change when new information on the firm's future cash flows are made available (Fama et al., 1969). The linkage of stock market reaction to firm value is a definitional issue: by convention, the market value of a firm is the stock prices multiplied by the number of outstanding shares. The relation of stock market reaction to corporate

performance, however, has to be predicated on a fundamental assumption that this market is informationally efficient, at least in the semi-strong form (Fama, 1970). Such efficiency form has been empirically established (see Copeland and Weston, 1988 for a compilation of evidence). In addition, the construct validity (specifically, the convergent validity) of stock market reaction with respect to managerial assessment of firm performance has been shown by Koh and Venkatraman (1991) in the case of joint venture formation within the IT sector.

Our approach to performance assessment based on stock market reaction can be positioned against other possible approaches. This would ultimately facilitate a systematic program of research linking IT governance to corporate performance. Accordingly, we propose that the alternative conceptualizations of corporate performance can be positioned using two underlying dimensions: time frame (ex ante versus ex post), and evaluation basis (archival versus perceptual). Figure 2 is a diagramatic representation of this typology. Quadrant 1 views corporate performance in terms of stock market reaction to the adoption of a particular strategy (Lubatkin and Shrieves, 1986) such as through abnormal returns. Quadrant 2 considers corporate performance more particularly as the business economic performance of firms (Venkatraman and Ramanujam, 1987), for instance through accounting income. Quadrant 3 positions corporate performance as a specialization within the broader construct of organizational effectiveness (Lewin and Minton, 1986) that includes user satisfaction. Quadrant 4 regards corporate performance as expectations of benefits and costs that can be analyzed using a standard discounted cash flow methodology (Pratt, 1989).

This study is positioned within Quadrant 1, since it provides a systematic external referent to a specific set of strategic decisions taken by firms. Moreover, we believe that at this stage of research within IT outsourcing, the other three quadrants may not be realistic or feasible approaches. For instance, on the ex- post

FIGURE 2
Conceptualization of Corporate Performance



side, it would be difficult to evaluate corporate performance impacts of IT outsourcing since this a recent phenomenon. Further, the use of historically-oriented accounting mode of conceptualizing performance has limitations imposed by differential conventions and standards. More importantly, the difference in adoption dates would necessitate a complicated longitudinal research design, especially if a perceptual-subjective basis is adopted. On the ex ante side, the utilization of benefit-cost expectations is problematic for research purposes as it may introduce confounding biases due to managerial motives and partiality. For our research, the use of archival data permits replicability, a critical characteristic that is missing if perceptual data are utilized. It also allows a systematic study of performance impacts without the need for a long time frame. In this light, our study offers an initial but a systematic examination that can be compared with results from both internal and external business reports compiled for a longer duration after the firm has outsourced.

The market value approach to appraising strategic actions has been a central foundation of mainstream financial research (see Copeland and Weston, 1988). It has been emerging within strategic management research, with important contributions to theory construction and testing (see Bromiley, 1990; Chakravarty and Singh, 1990). The compelling logic of this value-based research thrust is, however, only beginning to be accepted amongst IS academics (Alpar and Kim, 1990; Banker and Kauffman, 1988a, 1988b; Curley and Henderson, 1989). Hitherto, the performance issue in IS has focused on levels of analysis pertaining to individual users. Indeed, the development of an organizational-impact approach, especially that based on firm value, is still in the formative stage. As DeLone and McLean (1992: 80) aptly note, "...this is only a beginning; and it is in this area, 'assessing the business value of information systems,' where much work needs to be done." Thus, as IS research moves toward an organizational

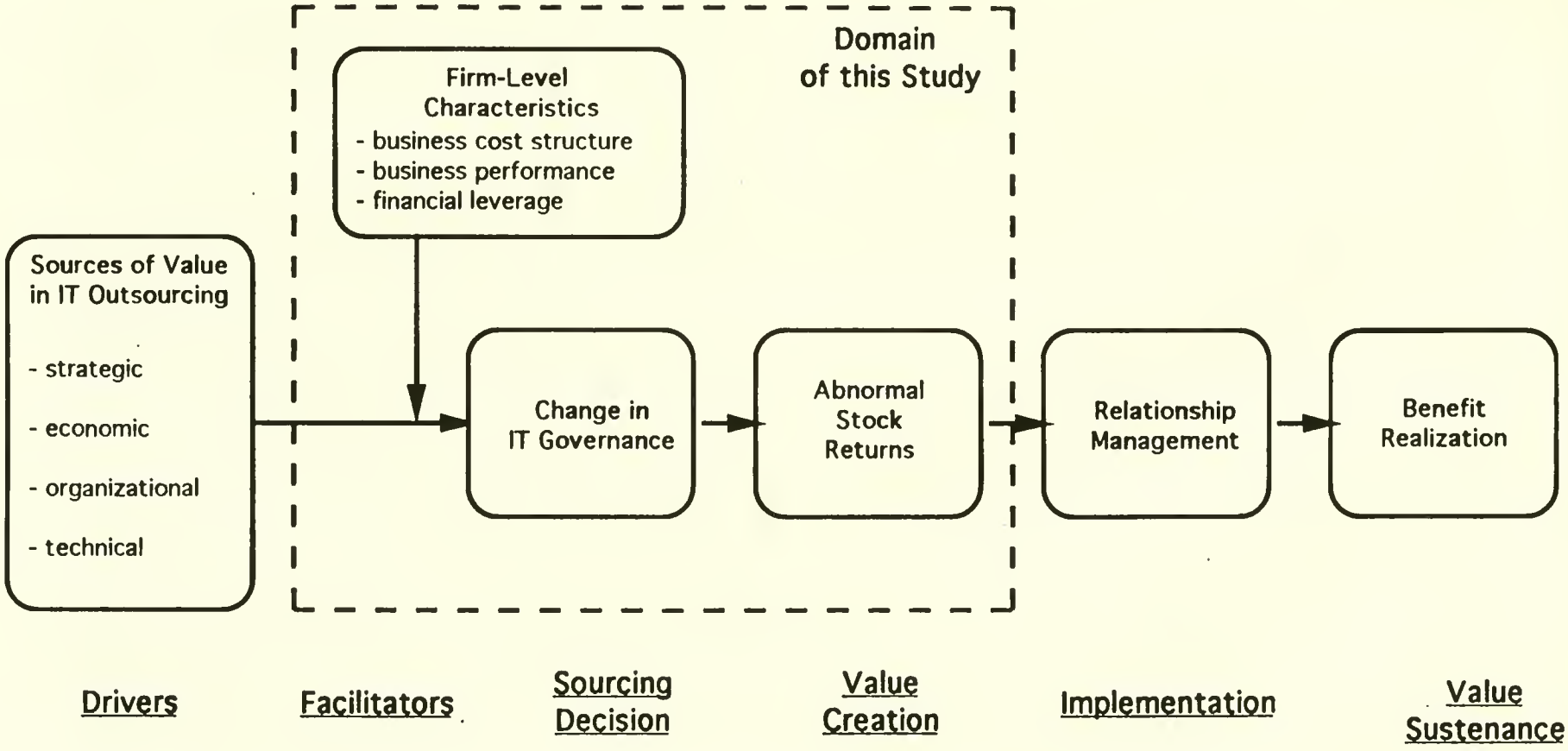
level of analysis, appropriate shifts in measurement approaches are needed. Firm value, as defined by stock prices, offers a fully-specified measure that is more comprehensive than individual accounting-based measures such as sales growth or profits (Lubatkin and Shrieves, 1986). Further, this approach is in line with the current emphasis on the use of firm value as a fundamental barometer of corporate performance (Stewart, 1991).

Managing the Process of Sustaining Value from IT Outsourcing

Adopting a value-based perspective, our study demonstrated that the stock market reacts favorably to IT outsourcing decisions. In a sense, these abnormal stock returns is a representation of firm value creation since there is an increase in stock prices relative to what the market can attain. However, for this value to be maintained over time, it is more than a simple matter of deciding on wha*t* to outsource, with whom to outsource, and how much to pay. It involves the development of an intricate process for managing the IT outsourcing agreement within the dyad that will sustain the value created. At this juncture, the process of linking value creation and value sustenance vis-a-vis IT outsourcing is still an open research question.

In the light of our study, we offer a preliminary process framework for delineating value through IT outsourcing (see Figure 3). The drivers of a firm's decision to outsource its IT infrastructure are the sources of value which are the potential benefits under four categories (strategic, economic, organizational, and technical) highlighted earlier in this paper. This change in IT governance is facilitated by the three firm-level characteristics, namely: business cost structure, business performance, and financial leverage. The direct impact of the decision is a creation of firm value as embodied in the event-based abnormal returns.

FIGURE 3
A Process Model of Sustaining Value through IT Outsourcing



The link between having abnormal returns (i.e., value creation) and realized benefits (i.e., value sustenance) is an implementation stage that entails a well-harmonized relationship management mechanism between the user and the vendor organizations. Basically, the delineation of the process determinants in this "black box" constitutes a crucial avenue for further research. A good starting point would be to examine the existing approaches in other relationship context such as mergers and acquisitions (Jemison and Sitkin, 1986) and partnerships (Henderson, 1990). We suggest that such determinants may draw from the arena of dyadic alignment and the mitigation of dyadic nuances such as transaction costs, agency costs, bargaining costs, and influence costs (Milgrom and Roberts, 1992). When the relationship is managed well, value is sustained and the firm is able to realize the full benefits arising from its initial decision to change the mode of IT governance.

Future Research Avenues

The empirical results of our study have important implications for theory development in IT outsourcing as a mode of governance. We offer below a set of recommendations that extend the research approaches adopted by this paper.

Descriptive versus Prescriptive Research. Our study demonstrates that the set of IT outsourcing contracts has hitherto been viewed favorably by the stock market. This by itself is an exciting finding that may induce some managers to confidently proclaim, "dump the data center!" However, we have adopted a descriptive approach that should not be taken as an overbearing prescription to cure all IS problems. Our methodology uses a large-sample statistical procedure that gives robust results rooted in an "on average" basis. This cannot be taken as a blanket normative recommendation for IS practice. The fundamental challenge facing firms is still to rationally examine its specific context that can lead to

effective IT outsourcing. This study shows that certain firm-level factors such as business cost structure and business performance are critical determinants central to the IT governance decision.

Our significant overall results on the stock market reaction to IT outsourcing suggests that investors do consider a discrete change in IT governance as an important factor in the valuation of a firm's worth. The U.S. capital market is an extremely sophisticated institution. There are myriad security analysts who individually and collectively are continually monitoring the specific actions and overall business health pertaining to every listed company. Our study presents rigorous evidence that IT sourcing is a sensitive value-impacting decision taken by a firm. The implication is that the capital market is an efficient monitor of managerial actions, and corporate executives should all the more conduct careful analyses before embarking on changes in the mode of IT governance.

Although descriptive research is an useful underpinning to promote a fuller understanding of a business phenomenon, prescriptive research would be more valuable especially for IS practice. We believe that this study constitutes a strong foundation for subsequent theory building and testing on a prescriptive basis. We enthusiastically call for more research that will draw more direct normative implications for the IS profession.

Fine-Grained versus Coarse-Grained Methodologies. We started off with a broad research question whether IT outsourcing, as a class of governance decisions, is perceived favorably by the stock market. This macro-level approach corresponds to what Harrigan (1983) terms as "coarse-grained methodologies" which are beneficial in terms of their statistical generalizability. This is in contrast to "fine-grained methodologies" that embody meticulous attention to details and consider idiosyncrasies of unique contingencies, and are therefore

suitable for deriving rich analyses of business phenomena although they are not amenable for statistical generalizability.

We then attempted to explicate the specific context using three firm-level characteristics -- business cost structure, business performance, and financial leverage -- that may affect the extent in which the stock market reaction is favorable. This approach moves toward "medium-grained methodologies" that explain some of the variance through our pooling of cross-sectional data. Our results here are useful for a better understanding of the underlying context in which IT outsourcing leads to favorable stock market reaction.

In the spirit of our value-based process framework suggested earlier, we believe that future research efforts, that adopts "fine-grained methodologies" for the antecedents and consequences of IT governance, are important. These studies can, for instance, be predicated on detailed field-based studies (e.g., Applegate and Montealegre, 1991). As argued by Harrigan (1983), the use of a hybrid approach based on a synthesis of the results across the continuum from "fine-grained" to "coarse-grained" research methodologies mitigates the limitations inherent in the separate investigations. This would then greatly advance theory building and testing for this emergent and important area of IS research.

Variance versus Process Theories. Following Mohr (1982), a useful distinction for theory construction in research is between "variance theories" and "process theories." The main purpose of variance theories is to establish causality under which the researcher stipulates precursors that are both necessary and sufficient conditions for some outcome. The main emphasis here is on a set of variables that are not time-ordered for the realization of the outcome. Further, these theories deal with efficient causes or forces that act directly on the units of analysis (i.e., the causality is "push-type"). In contrast, process theories seek to establish a probabilistic rearrangement as a basis for explanation. Precursors are

only necessary conditions for an outcome and the focus is on discrete states and events that are time-ordered. In addition, these theories deal with a final cause (i.e., the causality is "pull-type").

The crux of our study is a variance-theoretic approach since we have positioned firm-level characteristics as variables that determine stock market reaction to IT outsourcing decisions within an established framework of "push-type" causality. This has also been the foundation for our proposed value-based process model of IT outsourcing, although we have made improvements by introducing some rudimentary form of time ordering. However, we believe that significant contributions can be made in our understanding of this IT governance mechanism if researchers were to move beyond the variance-theoretic toward a process-theoretic approach. The focus of this research thrust would then be on the a "pull-type" causality or final cause (i.e., value sustenance) that derives its meaning from a time-ordered flow of discrete states that are necessary but not sufficient for changes in the final cause. The core of this theory would then move away from statistical variables and advance toward a comprehensive consideration of disparate events leading to a change in IT governance.

CONCLUSION

In this paper, we have established that the stock market reacts favorably to IT outsourcing decisions. We have uncovered that this reaction is affected by the firm's business cost structure and business performance. In the spirit of our conceptual perspectives and empirical findings, we attempted to delineate the delivery of value using a tentative process model. The quest for value through IT strategy is indeed an illusive venture for many an enterprise pursuing success in the competitive marketplace. This paper provides a first step in helping researchers and practitioners seek out the answer to the fundamental puzzle

raised in the paper: *does the stock market reacts favorably to IT outsourcing decisions*? Rooted in a descriptive basis, our answer is, "yes, it did!"

NOTES

[1]See for instance, CIO, October 15, 1991: pp. 23-45; Computerworld, September 9, 1991: pp. 67-68; Network World, February 17, 1992: pp. 1, 31-36.
[2]Computerworld, June 8, 1992: pp. 89-90
[3] Computerworld May 4, 1992: p. 1
[4] For a description of how these factors impact in one particular setting, see Applegate and Montealegre (1991).
[5] See also the series of 3 articles on contractual management in IT outsourcing in Network World, March 30, 1992: pp. 1, 23; April 6, 1992: pp. 29, 32; April 13, 1992: pp. 29-30.
[6] Computerworld, September 18, 1989: p. 90
[7] Computerworld, September 18, 1989: p. 89
[8] Computerworld, September 18, 1989: p. 90
[9]See also Information Week, September 21, 1992: pp. 19-35

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APPENDIX A
Content-Analytic Framework for Announcement Identification

Theme	Categories	Search Words/Phrases
Information Technology Outsourcing	Application Development Outsourcing	application design application development application programming outsourcing software contract system design system development system programming
	Data Center/Processing Outsourcing	data center data processing facilities management item processing outsourcing system contract system management system operation
	PC Services Outsourcing	outsourcing PC contract PC installation PC maintenance PC procurement PC services PC support technical support
	System Integration Outsourcing	outsourcing system consolidation system contract system design system integration system planning system programming system support
	Telecommunications/ Network Outsourcing	facilities management network contract network management network services outsourcing telecommunications contract telecommunications management telecommunications services

APPENDIX B
Establishing Robustness of Abnormal Returns Results Across Sectors

Our overall sample (N=58) met the size recommendation from a simulation study by Brown and Warner (1985) which found certain econometric problems with a portfolio size of 5 and 25 but not in a size of 50. For our subsamples in the service sector (N=30) and the industrial sector (N=28), the size falls between 25 and 50. To be conservative, we employed these subsamples purely for testing robustness of the abnormal returns results arising from the entire sample.

Tables B1 and B2 show that the general pattern of statistical significances for both abnormal returns and cumulative abnormal returns in the two sectors is very similar to that obtained from the entire sample. From the single-day returns, we see that the possibility of information delays occurs for the sectors, although leakages seem to be dominant only in the service sector. The results pertaining to the multiple-day returns, however, indicate that the favorable stock market reaction is consistent for both sectors.

As an additional test for robustness, we examined the sector difference in the abnormal returns and cumulative abnormal returns using the conventional statistic for comparing the means of two independent samples derived from separate normal populations. Using a pooled estimate of the variance of the abnormal returns that equals one (by virtue of our standardization), we computed the statistics which is unit-normal for large samples. From Tables B1 and B2, we note that there is no statistical difference between all the abnormal returns for the service and industrial sectors.

TABLE B1
Abnormal Returns in the Service and Industrial Sectors

Trading Day	Average Abnormal Returns	Standardized Abnormal Returns	
		Mean	Test Statistic
Service Sector			
t=-3	-0.6969%	0.1085	0.594
t=-2	-3.1758%	-0.1203	-0.659
t=-1	-0.2812%	0.3672	2.011*
t=0	0.1669%	0.0272	0.149
t=1	1.1532%	0.1756	0.962
t=2	0.9501%	0.2514	1.377+
t=3	-1.6933%	0.1909	1.045
t=4	0.3259%	0.1158	0.634
Industrial Sector			
t=-3	-0.4377%	-0.0213	-0.079
t=-2	0.3925%	0.2687	0.997
t=-1	0.4045%	0.3372	1.251
t=0	-0.1239%	0.0685	0.254
t=1	0.7742%	0.4821	1.788*
t=2	0.4962%	0.5973	2.215*
t=3	0.2938%	0.0465	0.173
t=4	-0.4005%	-0.1302	-0.483
Difference between Service and Industrial Sectors			
t=-3	-0.2592%	0.1298	0.494
t=-2	-3.5683%	-0.3890	-1.480
t=-1	-0.6857%	0.0300	0.114
t=0	0.2908%	-0.0413	-0.157
t=1	0.3790%	-0.3065	-1.166
t=2	0.4539%	-0.3459	-1.316
t=3	-1.9871%	0.1444	0.550
t=4	0.7264%	0.2460	0.936

Note: + p<.10; * p<.05

TABLE B2
Cumulative Abnormal Returns in the Service and Industrial Sectors

Event Window	Average Cumulative Abnormal Returns	Cumulative Standardized Abnormal Returns	
		Mean	Test Statistic
Service Sector			
[-1,0]	-0.1143%	0.3944	1.528^{+}
[-1,1]	1.0389%	0.5700	1.803*
[-1,2]	1.9890%	0.8214	2.250*
[-1,3]	0.2957%	1.0123	2.480**
Industrial Sector			
[-1,0]	0.2806%	0.2844	1.064
[-1,1]	1.0548%	0.6223	1.901*
[-1,2]	1.5510%	1.0409	2.754**
[-1,3]	1.8448%	1.0735	2.540**
Difference between Service and Industrial Sectors			
[-1,0]	-0.3949%	0.1100	0.296
[-1,1]	-0.0159%	-0.0523	-0.115
[-1,2]	0.4380%	-0.2195	-0.418
[-1,3]	-1.5491%	-0.0612	-0.104

Note: $^{+}$ p<.10; * p<.05; ** p<.01

APPENDIX C
Descriptive Statistics for Cross-Sectional Analysis

			Pearson Correlation Coefficients													
Variable	**Mean**	**Std Dev**	$Y_{[-1,0]}$	$Y_{[-1,1]}$	$Y_{[-1,2]}$	$Y_{[-1,3]}$	X_1	X_2	X_3	X_4	X_5	X_6	X_7	X_8	X_9	X_{10}
$Y_{[-1,0]}$	0.193	1.865	1.000													
$Y_{[-1,1]}$	0.408	2.216	0.815**	1.000												
$Y_{[-1,2]}$	0.726	2.649	0.763**	0.831**	1.000											
$Y_{[-1,3]}$	0.761	3.143	0.721**	0.815**	0.969**	1.000										
X_1	0.624	0.607	0.346*	0.407**	0.305*	0.309*	1.000									
X_2	0.005	0.111	-0.555**	-0.446**	-0.390**	-0.348*	-0.160	1.000								
X_3	0.839	1.855	-0.060	-0.059	-0.038	-0.058	-0.257+	-0.022	1.000							
X_4	15.281	26.799	-0.356**	-0.251+	-0.249+	-0.240+	-0.168	0.058	0.056	1.000						
X_5	0.491	0.504	-0.121	-0.076	-0.041	-0.095	0.337*	0.239+	-0.077	-0.042	1.000					
X_6	0.224	0.421	0.058	0.050	0.133	0.104	0.082	-0.236+	-0.110	-0.050	-0.112	1.000				
X_7	0.724	0.451	0.201	0.249+	0.082	0.033	0.140	-0.123	0.086	-0.066	0.026	-0.426**	1.000			
X_8	0.034	0.184	0.037	-0.008	-0.053	-0.037	0.017	0.116	-0.001	-0.005	0.193	-0.110	-0.083	1.000		
X_9	0.052	0.223	-0.072	-0.082	-0.149	-0.123	0.141	0.092	0.068	-0.117	0.238+	0.256+	-0.193	-0.050	1.000	
X_{10}	0.345	0.479	-0.127	-0.046	-0.249	0.004	-0.168	0.117	-0.187	0.110	0.011	-0.037	-0.446**	-0.152	-0.017	1.000

Note: + p<.10; * p<.05; ** p<.01

Date Due